

# I-405 Bellevue Nickel Improvement Project I-90 to Southeast 8th Street



**Corridor Program**

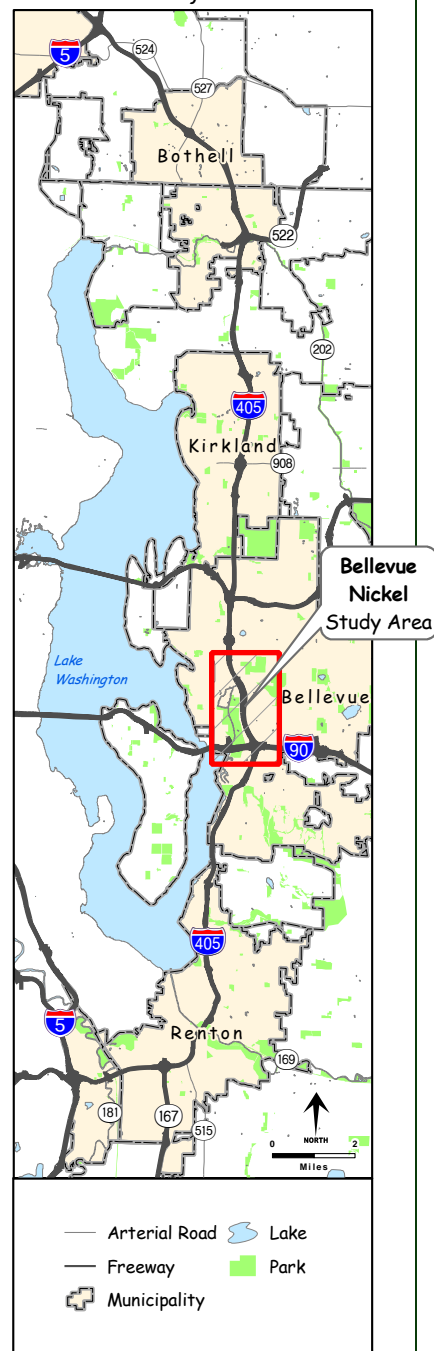
Congestion Relief & Bus Rapid Transit Projects

## AIR QUALITY DISCIPLINE REPORT

January 2006



*I-405 Project Area*



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# Glossary

<b>Ambient</b>	Surrounding atmosphere
<b>Air emissions</b>	Pollutants emitted into the air, such as ozone, carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide and others.
<b>Air pollutant</b>	Any substance in air that could, in high enough concentration, harm people, animals, vegetation, or material. Pollutants may include almost any natural or artificial composition of matter capable of being airborne. They may be in the form of solid particles, liquid droplets, gases, or a combination thereof. Generally, they fall into two main groups: (1) those emitted directly from identifiable sources and (2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric constituents.
<b>Air quality standards</b>	The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.
<b>Attainment area</b>	An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.
<b>Background level</b>	In air pollution control, the concentration of air pollutants in a definite area during a fixed period of time prior to starting or stopping a source of a regulated emission. In toxic substances monitoring, the average presence in the environment, originally referred to as a naturally occurring phenomena.
<b>Best Management Practice (BMP)</b>	BMPs are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption. Please see Appendix A for a complete list of BMPs.
<b>Carbon dioxide (CO<sub>2</sub>)</b>	A colorless odorless, gas produced by burning fossil fuels, sometimes referred to as a greenhouse gas because it contributes to global warming.
<b>Carbon monoxide (CO)</b>	A colorless odorless poisonous gas produced by incomplete combustion of fossil fuel.
<b>Carboxyhemoglobin</b>	Hemoglobin (the iron-containing part of red blood cells) in which the iron is bound to carbon monoxide (CO) instead of oxygen.
<b>Carcinogenic or carcinogen</b>	Capable of causing cancer. A suspected carcinogen is a substance that may cause cancer in humans or animals but for which the evidence is not conclusive.
<b>Criteria pollutants</b>	The 1970 amendments to the Clean Air Act required the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for six pollutants: ozone (O <sub>3</sub> ), carbon monoxide (CO), total suspended particulates, sulfur dioxide (SO <sub>2</sub> ), lead (Pb), and nitrogen oxide (NO <sub>x</sub> ). The term, "criteria pollutants" derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. Standards are set or revised on the basis of these criteria.

# Glossary

<b>Dispersion model</b>	A mathematical prediction of how pollutants from a discharge or emission source will be distributed in the surrounding environment under given conditions of wind, temperature, humidity, and other environmental factors.
<b>Emission factor</b>	The relationship between the amount of pollution produced and the amount of raw material processed. For example, an emission factor for a blast furnace making iron would be the number of pounds of particulates per ton of iron ore.
<b>Emission standard</b>	The maximum amount of air-polluting discharge legally allowed from a single source, mobile or stationary.
<b>Emission</b>	Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities, vehicles, and other sources.
<b>Freeboard</b>	The vertical distance of the space from the top of a truck to the top of the material that is transported in the truck.
<b>Fugitive emissions</b>	Air pollutants released to the air other than those from stacks or vents; typically small releases from leaks in plant equipment such as valves, pump seals, flanges, sampling connections, etc.
<b>Hazardous air pollutants</b>	Air pollutants that are not covered by ambient air quality standards but which, as defined in the Clean Air Act, may reasonably be expected to cause or contribute to irreversible illness or death. Such pollutants include asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides, and vinyl chloride.
<b>Inversion</b>	An atmospheric condition caused by the temperature increasing with elevation, resulting in a layer of warm air preventing the rise of cooler air trapped beneath it. This condition prevents the rise of pollutants that might otherwise be dispersed. Trapping pollutants near the ground can increase the concentration of ozone to harmful levels.
<b>Level of service</b>	A measure of system-operating performance for roadways, transit, non-motorized, and other transportation modes. For example, roadway measures of level of service often assign criteria based on volume-to-capacity ratios.
<b>Maintenance area</b>	Area that has recently met the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act and for which air quality is being managed to continue to meet the standards.
<b>Mobile source</b>	Any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, and locomotives.
<b>Mobile model</b>	A series of emissions models developed by EPA to estimate emissions of air pollutants from mobile sources during operation. We used versions 5a and 6.2 on the I-405 corridor program.
<b>National Ambient Air Quality Standards (NAAQS)</b>	Standards established by EPA for pollutant concentrations in outside air throughout the country. (See "criteria pollutants.")
<b>Nitrogen dioxide (NO<sub>2</sub>)</b>	The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog.



# Glossary

<b>Nitrogen oxide (NO<sub>x</sub>)</b>	Product of combustion from transportation and stationary sources and a major contributor to the formation of ozone in the troposphere.
<b>Non-attainment area</b>	Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.
<b>Ozone (O<sub>3</sub>)</b>	Ozone is a natural form of oxygen that provides a protective layer, shielding the earth from ultraviolet radiation. Ozone in the troposphere (the lowest layer of the atmosphere, where most clouds are located and where most weather occurs) is produced through complex chemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons, released into the atmosphere through the combustion, handling, and processing of petroleum products; and sunlight. Ozone is a chemical oxidant and major component of photochemical smog. It can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants for which the Clean Air Act required the EPA to set standards.
<b>Particulate</b>	A very small solid, suspended in air or water, which can vary widely in size, shape, density, and electrical charge.
<b>Parts per million (ppm)</b>	Parts per million parts; a measurement of concentration on a weight or volume basis. This term is equivalent to milligrams per liter (mg/L), which is the preferred term.
<b>Persistence</b>	Refers to the length of time a compound stays in the environment, once introduced. A compound may persist for less than a second or it may persist indefinitely.
<b>Photochemical oxidants</b>	Air pollutants formed by the action of sunlight on oxides of nitrogen and hydrocarbons.
<b>PM2.5</b>	Particulate matter less than 2.5 micrometers in diameter.
<b>PM10</b>	A standard for measuring the amount of solid or liquid matter suspended in the atmosphere, i.e., the amount of particulate matter less than 10 micrometers in diameter; particles smaller than PM10 penetrate into the deeper portions of the lung, affecting sensitive population groups such as individuals with respiratory ailments and children.
<b>Precursor</b>	An intermediate compound in a chain of chemical reactions from which VOCs are formed.
<b>Smog</b>	Dust, smoke, or chemical fumes that pollute the air and make hazy, unhealthy conditions. Automobile, truck, bus, and other vehicle exhausts and particulates are usually trapped close to the ground, obscuring visibility and contributing to a number of respiratory problems.
<b>Troposphere</b>	The lowest layer of the atmosphere, where most clouds are located, and where most weather occurs. The troposphere is the portion of the atmosphere closest to the earth's surface.
<b>Volatile organic compounds (VOC)</b>	Any organic compound that evaporates readily into the atmosphere. VOCs contribute significantly to photochemical smog production and to certain health problems.

## Acronyms and Abbreviations

µg/m <sup>3</sup>	micrograms per cubic meter
AQMPs	Air Quality Maintenance Plans
BNSF	Burlington Northern Santa Fe
CFR	Code of Federal Regulations
CO	carbon monoxide
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	high-occupancy vehicle
I-405	Interstate 405
I-90	Interstate 90
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NB	northbound
NEPA	National Environmental Policy Act
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
Pb	lead
PM	particulate matter
ppm	parts per million
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
ROD	Record of Decision

## Acronyms and Abbreviations

SB	southbound
SE	southeast
SO <sub>2</sub>	sulfur dioxide
SIP	State Implementation Plan
TIP	Transportation Improvement Program
VOCs	volatile organic compounds
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation



# Introduction

In 1998, the Washington State Department of Transportation (WSDOT) joined with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), Central Puget Sound Regional Transit Authority (Sound Transit), King County, and local governments in an effort to reduce traffic congestion and improve mobility in the Interstate 405 (I-405) corridor. In fall 2002, the combined efforts of these entities culminated in the *I-405 Corridor Program Final Environmental Impact Statement (EIS)* and *FHWA Record of Decision (ROD)*.

The ROD selected a project alternative that would widen I-405 by as many as two lanes in each direction throughout its 30-mile length. The ultimate configuration of the selected alternative includes buffers separating general-purpose lanes from parallel high-occupancy vehicle (HOV) lanes (potentially used by future high-capacity transit). The design also allows for expanded “managed lane” operations along I-405 that could include use of HOV lanes by other user groups, such as trucks.

In 2003, the Washington State legislature approved a statewide transportation-funding plan called the “nickel package.” The nickel package provided funding for congestion relief projects in three critical traffic hotspots along the I-405 Corridor: Renton, Bellevue, and Kirkland. The Bellevue Nickel Improvement Project is one of several projects now moving forward as part of a phased implementation of the I-405 Corridor Program. Exhibit 1 shows the location of the Bellevue Nickel Improvement Project.

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In 2003, the Washington State legislature approved a statewide transportation-funding plan called the “nickel package.” The nickel package provides funding for congestion relief projects in three critical traffic hotspots along the I-405 Corridor, including Bellevue.

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Traffic moving along I-405

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Exhibit 1. Project Vicinity Map



In keeping with the direction established in the Final EIS and ROD, we are preparing a National Environmental Policy Act (NEPA) Environmental Assessment (EA) that focuses on project-level effects of constructing and operating the Bellevue Nickel Improvement Project.

We will base the EA on the analysis in the *I-405 Corridor Program Final EIS*, and will describe any new or additional project changes, information, effects, or mitigation measures not identified and analyzed in the corridor-level Final EIS (FEIS). The project-level EA for the Bellevue Nickel Improvement Project will not reexamine the corridor-level alternatives, impacts, and mitigation measures presented in the corridor-level FEIS, or the decisions described in the ROD.

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The Environmental Assessment will describe new project changes, information, effects, or mitigation measures, but the assessment will not revisit the alternatives, impacts, and mitigation measures evaluated in the corridor-level EIS or the decisions documented in the *Record of Decision*.

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## What alternatives do we analyze in this discipline report?

This discipline report is one of 19 environmental elements WSDOT will study to analyze the effects of the Bellevue Nickel Improvement Project. All of the discipline reports will analyze one build alternative and one “no build” or “no action” alternative. This approach is consistent with FHWA’s guidelines for preparing a NEPA EA.

## What is the No Build Alternative?

NEPA requires us to include and evaluate the No Build Alternative in this discipline report. We use this approach to establish an existing and future baseline for comparing the effects associated with the Build Alternative. We assume the No Build Alternative will maintain the status quo: only routine activities such as road maintenance, repair, and safety improvements would occur within the corridor between now and 2030. The No Build Alternative does not include improvements that would increase roadway capacity or reduce congestion on I-405. We describe these improvements further in the Bellevue Nickel Improvement Project Traffic and Transportation Discipline Report.

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We assume the No Build Alternative will maintain the status quo: only routine activities such as road maintenance, repair, and safety improvements would occur within the corridor between now and 2030.

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## What are the principal features of the Build Alternative?

The Bellevue Nickel Improvement Project will add one new general-purpose lane in each direction along a 2-mile section of I-405 between I-90 and SE 8th Street. We will generally use the

inside or “median” side of I-405 for construction. After we re-stripe the highway, the new lanes will occupy the outside of the existing roadway. The project also includes new stormwater management facilities and better drainage structures and systems.

Other project activities include developing off-site wetland mitigation as well as on-site stream mitigation areas to compensate for the loss of these resources within the project area. We expect project construction to begin in spring 2007 and the improved roadway to be open to traffic by fall 2009.

## Improvements to Southbound I-405

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We will add one lane in the southbound direction of I-405 from approximately SE 8th Street to I-90.

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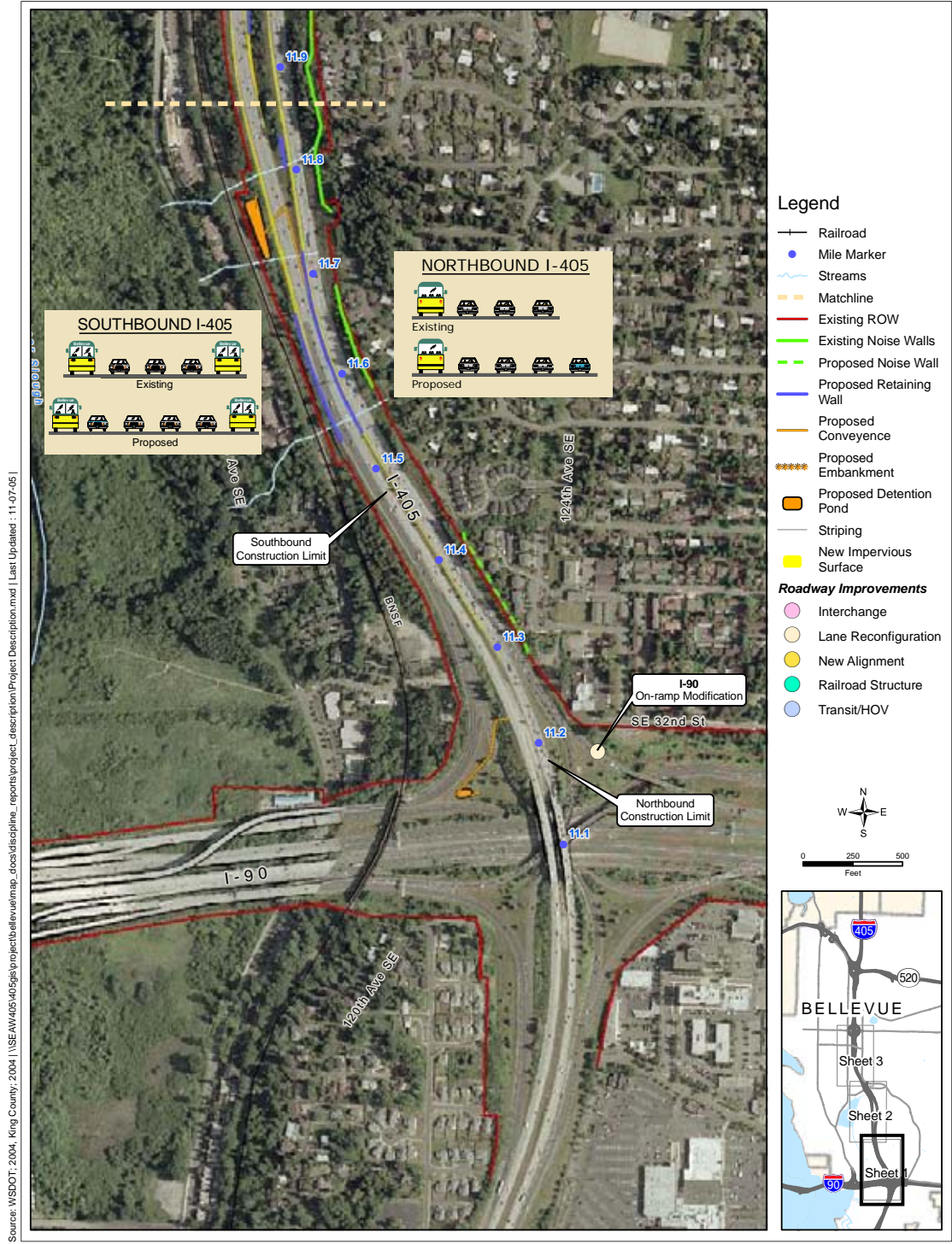
In the southbound (SB) direction, we plan to add one new travel lane from approximately Southeast (SE) 8th Street to I-90 (Exhibits 2, 3, and 4). In addition, the existing outside HOV lane at I-90 will be extended north so that it begins at the on-ramp from SE 8th Street. In order to add these lanes and maintain traffic flow during construction, we will shift approximately 3,000 feet of the SB roadway as much as 200 feet east into the existing median. The relocated SB roadway will connect to the existing SB travel lanes just north of the I-90 interchange, and south of the existing bridge over SE 8th Street.

We will build a new tunnel underneath the Burlington Northern Santa Fe (BNSF) railroad, just east of the existing Wilburton Tunnel, to accommodate the relocated and widened SB roadway. The existing tunnel does not have the capacity to accommodate additional lanes of SB traffic.

The existing SB travel lanes and the Wilburton Tunnel will remain open to traffic during construction of the new tunnel and the relocated/widened SB lanes. We will also build the new tunnel wide enough to accommodate additional lanes. The existing tunnel will remain after we complete the improvements.



Exhibit 2. Proposed Bellevue Nickel Project Improvements (Sheet 1 of 3)





### Exhibit 3. Proposed Bellevue Nickel Project Improvements (Sheet 2 of 3)

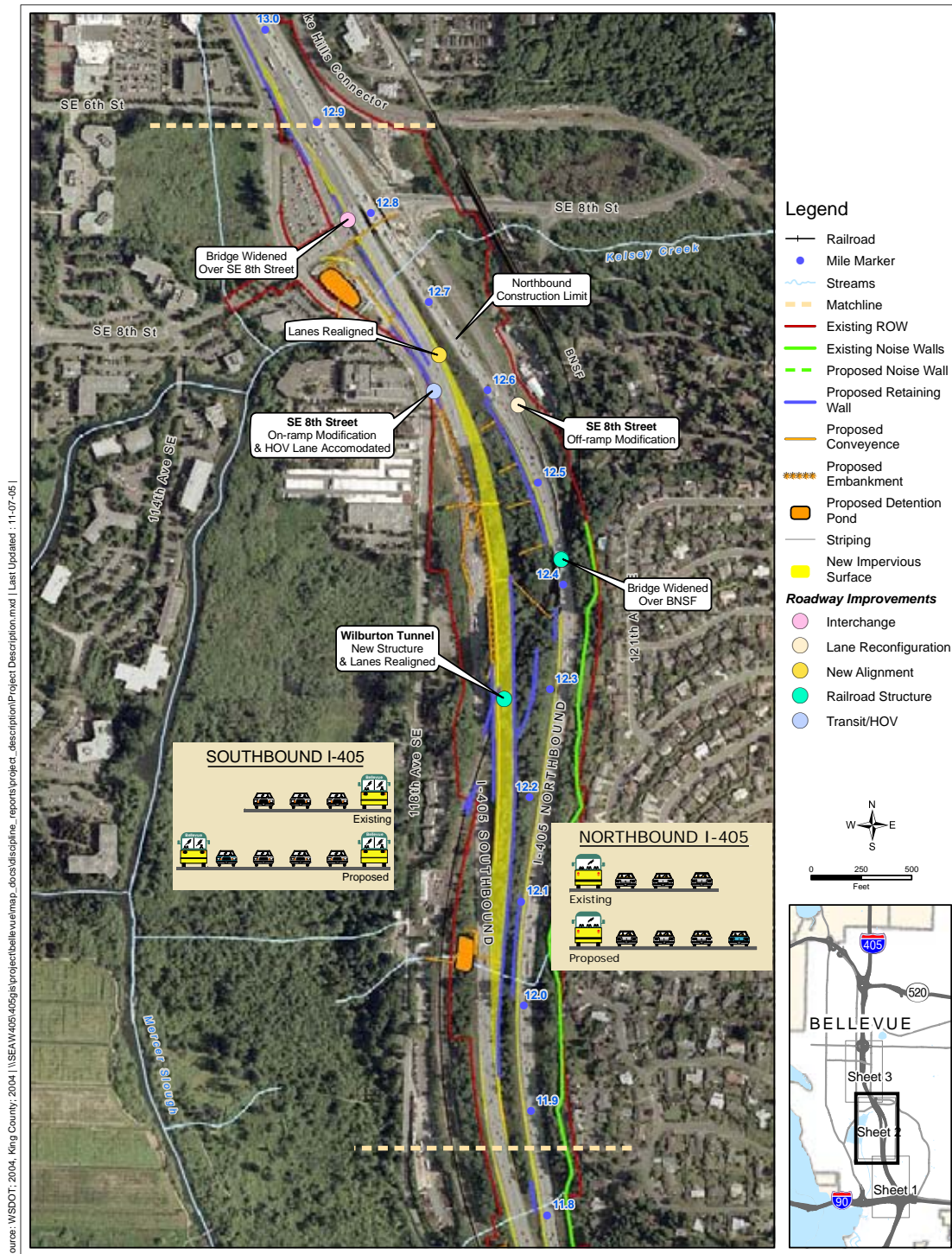
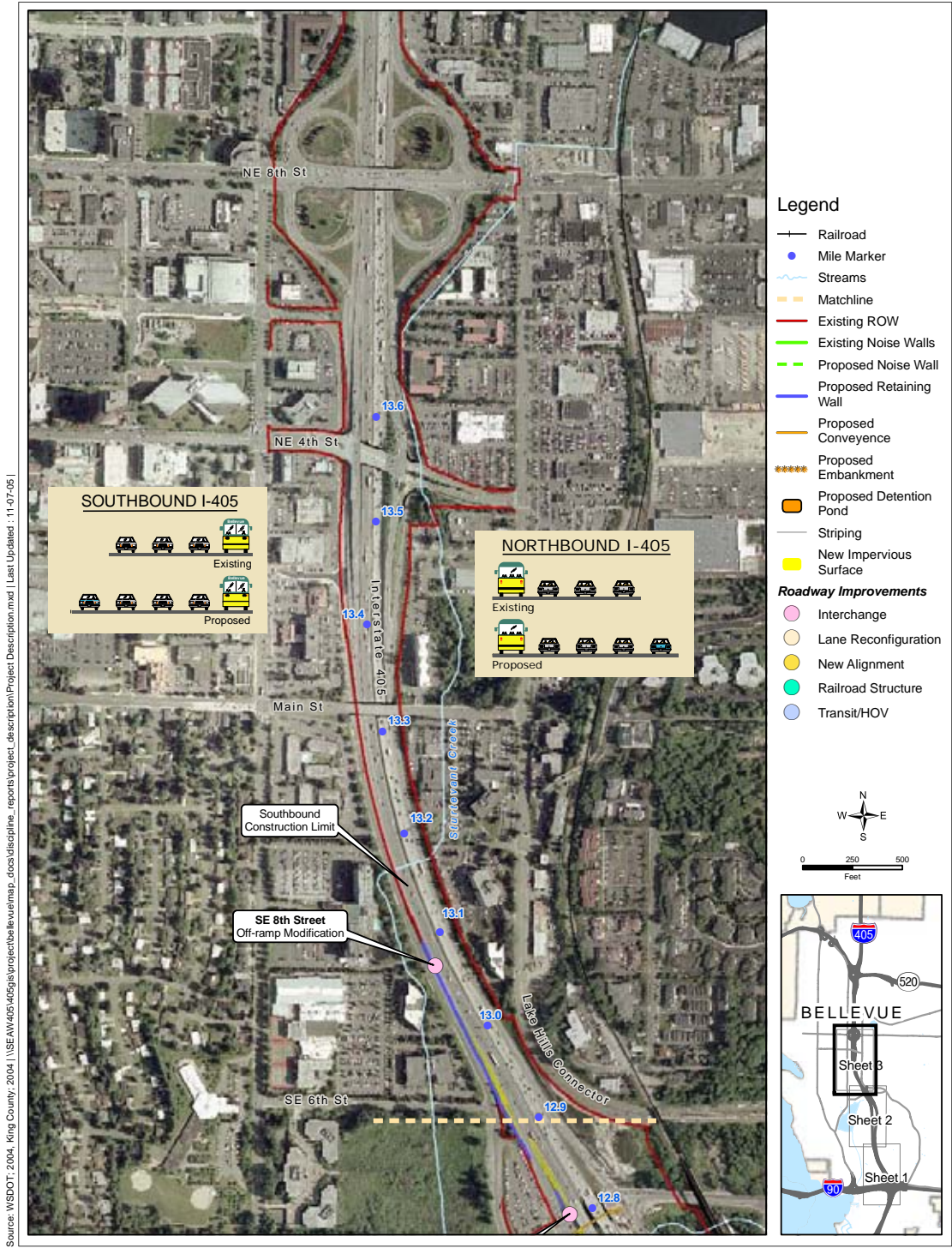




Exhibit 4. Proposed Bellevue Nickel Project Improvements (Sheet 3 of 3)



We will also include the following improvements in the Build Alternative:

- Modify the existing off-ramp at SE 8th Street to make room for an additional southbound lane on I-405. The off-ramp will then become a single-lane, optional off-ramp (i.e., the off-ramp will no longer be an “exit only” off-ramp).
- Build a retaining wall between the SB travel lanes and the off-ramp at SE 8th Street.
- Widen the existing bridge over SE 8th Street to the west to accommodate the new SB lane.
- Modify the existing on-ramp at SE 8th Street to tie into the relocated SB general-purpose travel lanes.
- Reconfigure the on-ramp at SE 8th Street to accommodate the extended outside HOV lane.
- Temporarily shift the existing BNSF railroad track from its current alignment to allow for continuous railroad operation during construction of the new tunnel.
- Construct retaining walls along the eastern edge of the relocated SB travel lanes.

### Improvements to Northbound I-405

In the northbound (NB) direction, we plan to add one new travel lane from approximately I-90 to SE 8th Street (Exhibits 2, 3, and 4). We will add one new lane to the NB ramp from I-90. We will shift the NB lanes to allow all of the proposed widening to occur on the inside, or median side of the existing roadway.

Additional improvements include:

- Re-stripe the westbound/eastbound I-90 on-ramp to NB I-405 resulting in one lane becoming two lanes in the NB direction.
- Widen, shift, and re-stripe NB I-405 travel lanes north of I-90 to allow the westbound I-90 to NB I-405 on-ramp and the eastbound I-90 to NB I-405 on-ramp to enter I-405 without having to merge into a single lane.
- Construct several retaining walls needed for road widening in locations that allow for existing and future widening of I-405.

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We will add one lane in the northbound direction of I-405 from approximately I-90 to SE 8th Street. All widening of the northbound mainline will occur on the inside (median side) of the existing roadway.

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- Construct a noise barrier approximately 725 feet long and 16 feet high (See Exhibit 2).
- Widen the existing bridge over the BNSF Railroad to the west to accommodate the new NB lane.
- Modify the NB off-ramp to SE 8th Street to make it a single-lane “exit-only” off-ramp.
- Transition the NB travel lanes back into the existing lane configuration before crossing over SE 8th Street.

## Improvements to the Stormwater Management System

Managing stormwater for the I-405 Bellevue Nickel Improvement Project involves the collection and treatment of rainfall runoff from the new project pavement consistent with the guidelines in the WSDOT Highway Runoff Manual.

Currently, we treat less than 5 percent of the existing runoff from paved surfaces in the project area before discharging it. We will improve this condition by treating 17 percent more area than the new paved surface area we create. By treating a greater area, we improve flow control and remove pollutants from a portion of the existing roadway as well as from newly constructed areas.

Reconfiguration and new construction associated with the SB lanes will mean that we need to replace much of the existing drainage system. We will continue to use open roadside ditches along the shoulders of the roadway shoulders where possible. We will use standard WSDOT catch basins and manhole structures to move the roadway runoff to a system of stormwater drain pipes. These features will transport runoff to treatment and flow-control facilities within the existing ROW.

We will construct three new stormwater ponds (detention ponds combined with stormwater treatment wetlands) as part of the project and enlarge the existing pond at SE 8th Street. Two of the new ponds will be located south of the Wilburton Tunnel between the SB lanes and the BNSF railroad ROW. We will construct the third new pond in the northwest quadrant of the I-90/I-405 interchange. The project will discharge treated stormwater following existing flow patterns to Mercer Slough or to the wetlands that surround it.

## Avoidance and Minimization Measures

WSDOT will use Best Management Practices (BMPs), WSDOT Standard Specifications, and design elements to avoid or minimize potential effects to the environment for the Bellevue

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### Best Management Practices (BMPs)

BMPs are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption. Please see Appendix A for a complete list of BMPs.

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### WSDOT Standard Specifications

Guidelines and procedures established by WSDOT for roadway design and construction in a variety of design, engineering, and environmental manuals.

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Nickel Improvement Project. Collectively, these measures to avoid or minimize potential effects to the environment are known as “avoidance measures.” We describe these measures in more detail in an Appendix A. If the project has additional effects not addressed in the avoidance measures, we will address these measures through mitigation.

## Wetland and Stream Mitigation Sites

We will compensate for adverse effects to wetlands and their buffers by creating just over an acre of wetland within the boundaries of Kelsey Creek Park (Exhibit 5). The site is located north of the intersection of Richards Road and the Lake Hills Connector.

Our general concept will be to create an area that will transition from forested land beside the Lake Hills Connector to wetlands within Kelsey Creek Park. We will reshape the surface area to create favorable conditions for the necessary wetland aquatic characteristics, and we will replant and enhance habitat in the area by constructing habitats and replanting adjacent roadside areas with forest-type vegetation.

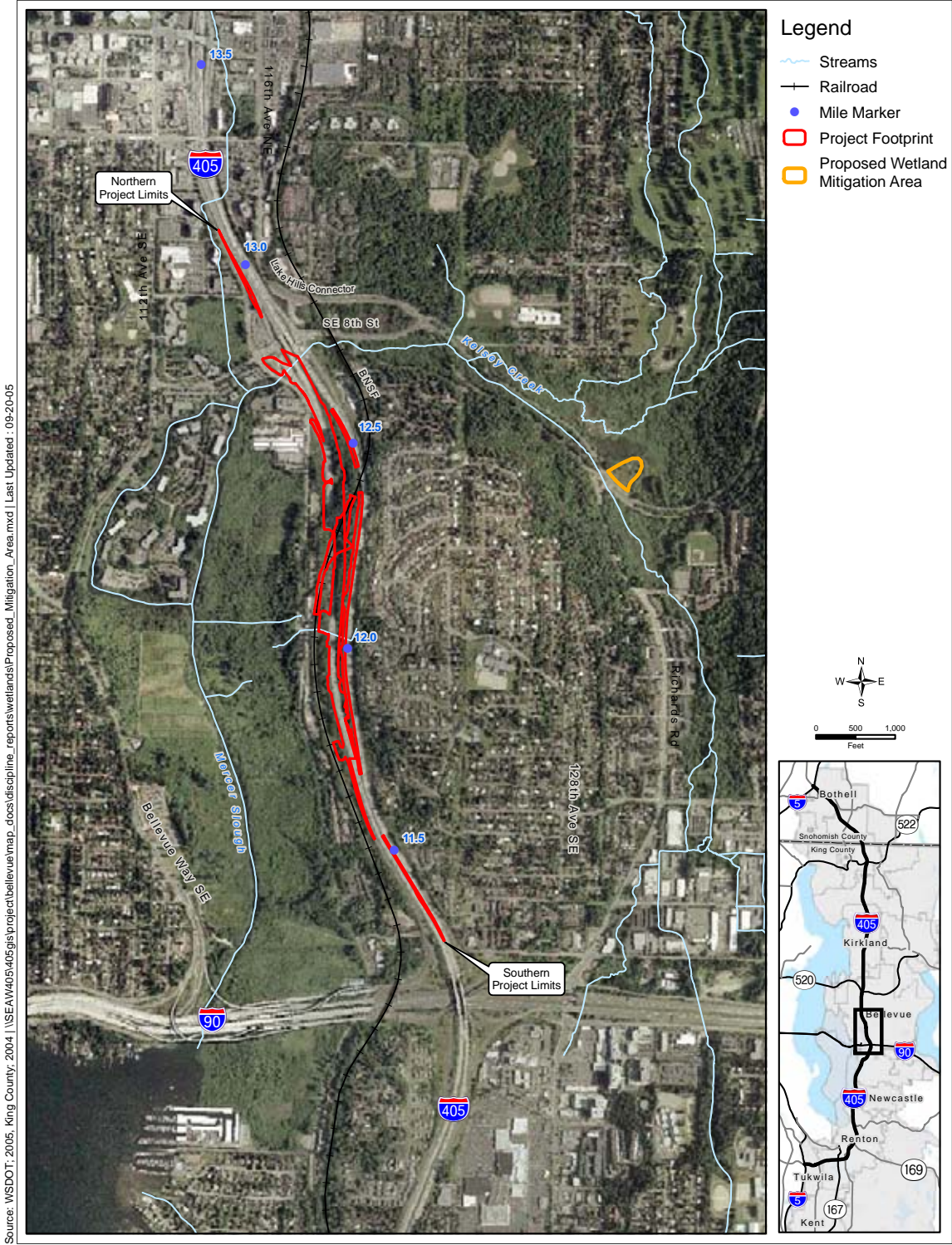
Similarly, we will compensate for unavoidable effects to “Median Stream,” the unnamed stream within the I-405 median. We have developed a conceptual stream mitigation plan that includes on-site habitat restoration and creation. The conceptual stream mitigation plan includes the following specific elements (See Exhibit 6):

- Connect the new Median Stream culvert under I-90 to the existing channel and wetland located west of SB I-405.
- Create approximately 500 linear feet of stream channel along the western slope of SB I-405.
- Buffer the created stream channel with approximately 16,000 square feet of native streamside vegetation.
- Enhance approximately 300 linear feet of riparian habitat west of SB I-405 by removing selected non-native invasive plant species and replacing with native streamside vegetation.

We provide more detailed information about mitigation efforts planned in conjunction with the Bellevue Nickel Improvement in the Surface Water, Floodplains, and Water Quality, and Wetlands Discipline Reports.

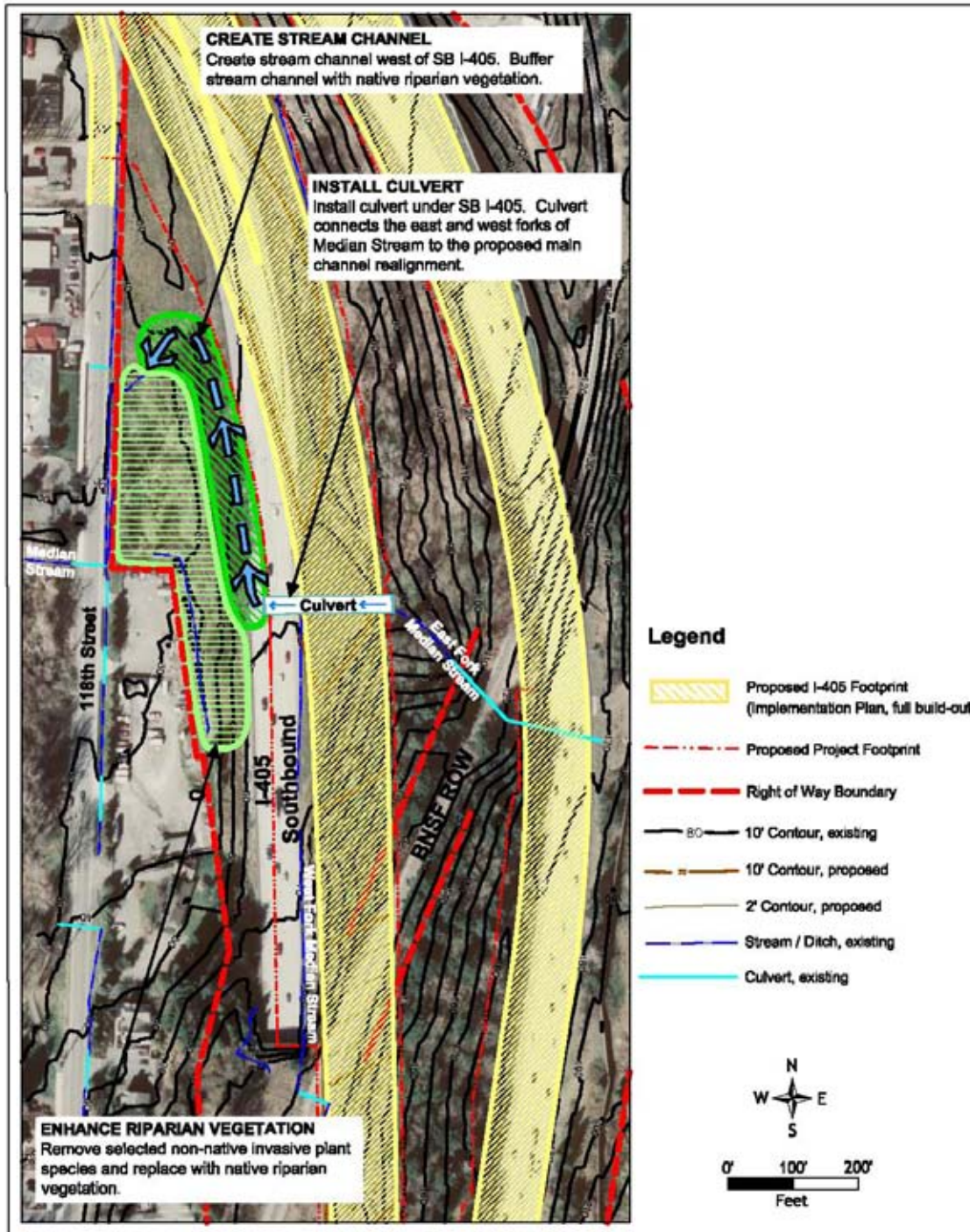


Exhibit 5. Proposed Wetland Mitigation Area





## Exhibit 6. Conceptual Stream Mitigation Plan





## Why do we consider air quality as we plan this project?

Air quality refers to the cleanliness of the atmosphere. We consider it because pollutants in the air we breathe can have negative health effects for humans and can harm plants, animals, and materials.

The Programmatic EIS Air Quality Review evaluated air quality for the I-405 Corridor Program (Washington State Department of Transportation 2002). The corridor-level review evaluated regional effects of the I-405 Corridor Program, including the I-405 Bellevue Nickel Improvement Project study area, but did not evaluate localized carbon monoxide (CO) effects.

Information available then was insufficient to determine if, or to what extent, the projects would affect local pollutant levels.

During the Corridor Program analysis, the Puget Sound Regional Council (PSRC) refined the Metropolitan Transportation Plan (MTP) to be consistent with the I-405 Corridor Program Selected Alternative. The Selected Alternative was found to conform at the regional scale to the Puget Sound region's air quality maintenance plans. This report supplements the information in the Programmatic EIS Air Quality Review and provides updated information about air quality.

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### **Puget Sound Regional Council**

The Puget Sound Regional Council (PSRC) is an inter-governmental agency that addresses regional transportation issues.

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## What are the key points of this report?

- The Proposed Project is currently located in carbon monoxide (CO) and ozone maintenance areas;
- The I-405 Corridor Programmatic EIS Air Quality Review<sup>1</sup> evaluated the regional effects of the I-405 Corridor Program, including the Bellevue Nickel Improvement Project study area;
- The project is exempt from project-level conformity requirements because this project will not increase traffic or change the configuration of any intersection;

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<sup>1</sup> WSDOT, 2002



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I-405 plays a critical role in the regional movement of people and freight.

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- The project will not cause or contribute to any new violation of the National Ambient Air Quality Standards (NAAQS);
- The project will meet all conformity requirements once the project is included in the Transportation Improvement Plan (TIP); and
- Avoidance and minimization measures during construction applicable to the Bellevue Nickel Improvement Project are summarized in this report.

# Existing Conditions

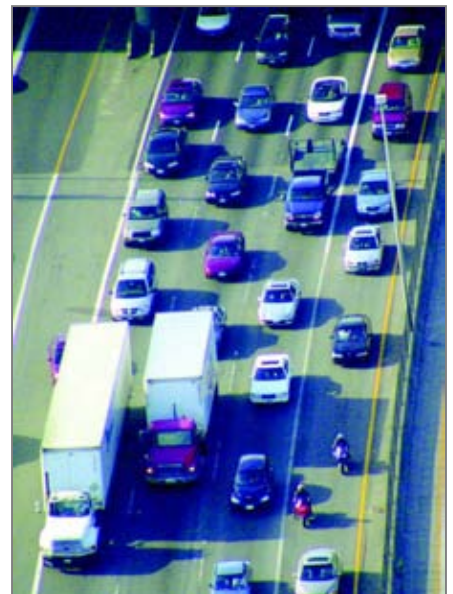
## Who regulates air quality?

The U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA) together regulate air quality in the study area.

## What standards apply to air quality?

Under the Clean Air Act, the EPA has established National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for CO, particulate matter less than 10 micrometers in size (PM<sub>10</sub>), particulate matter less than 2.5 micrometers in size (PM<sub>2.5</sub>), ozone, sulfur dioxide (SO<sub>2</sub>), lead (Pb), and nitrogen dioxide (NO<sub>2</sub>). The purpose of the standards is to protect human health and welfare. Exhibit 7 summarizes the standards applicable to transportation projects.

The I-405 corridor lies within ozone and CO maintenance areas (see sidebar). Air quality emissions in the Puget Sound region are currently being managed under the provisions of Air Quality Maintenance Plans (AQMPs) for ozone and CO. PSCAA and Ecology developed the current plans, and EPA approved them in 1996.



Congestion building along the I-405 corridor

### Maintenance Areas

Air quality maintenance areas are regions that have recently attained compliance with the National Ambient Air Quality Standards.

## Exhibit 7. Summary of Ambient Air Quality Standards

Pollutant	Standard <sup>1</sup>	Measurement Averaging Time
Carbon Monoxide	9 ppm	8 hours
	35 ppm	1 hour
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup>	Annual
	150 µg/m <sup>3</sup>	24 hours
Particulate Matter (PM <sub>2.5</sub> )	15 µg/m <sup>3</sup>	Annual
	65 µg/m <sup>3</sup>	24 hours
Ozone	0.08 ppm	8 hours
	0.12 ppm	1 hour
Nitrogen Dioxide	0.053 ppm	Annual
Lead	1.5 µg/m <sup>3</sup>	Quarterly
Sulfur Oxides	0.03 ppm	Annual
	0.14 ppm	24 hours

<sup>1</sup>Washington State (1987) and PSCAA Regional Standards (1996)

### Regionally Significant Project

A *regionally significant project* is a transportation project performed on a facility that serves regional transportation needs (such as access to and from the area outside of the region, or major activity centers in the region).

Any regionally significant transportation project (see sidebar) in the Puget Sound Air Quality Maintenance areas must conform to the AQMPs. Under the plan, the project cannot cause or contribute to any new violation of any NAAQS, increase the frequency or severity of any existing violation of any NAAQS, or delay timely attainment of the NAAQS.

The I-405 Programmatic EIS Air Quality Review addressed the characteristics and health effects of pollutants associated with transportation projects.

Because the project will not increase traffic or change the configuration of any intersection, the project will not have a substantial effect on localized air quality around any intersection. As a result, the project is exempt from project-level conformity requirements in accordance with the Code of Federal Regulations (CFR) 40 CFR 93.123.

### Particulate Emissions in the Form of Fugitive Dust

A very small solid, suspended in air or water, which can vary widely in size, shape, density, and electrical charge.

PSCAA regulates particulate emissions in the form of fugitive dust generated during construction activities. Fugitive dust emissions will be improved with the best available control technology (PSCAA Rule 1, Section 9.15). According to PSCAA Rule 1, Section 9.15, fugitive dust from construction

activities shall not be injurious to human health, plants and animals, or property, and shall not unreasonably interfere with the enjoyment of life and property. Also, a person may not operate a vehicle that deposits particulate matter on a paved public highway (PSCAA Rule 1, Section 9.15).

## What are the emission trends for air quality?

Regional air pollutant trends have generally followed national patterns over the last 20 years. While the average weekday vehicle miles traveled in the central Puget Sound region has increased from 30 million miles in 1981 to 65 million in 1999 (PSRC 2000), pollutants associated with transportation sources have decreased over time due to more stringent federal emission standards for new vehicles and the gradual replacement of older, more polluting vehicles.

Carbon monoxide (CO) is the criteria pollutant most closely tied to transportation, and more than 90% of the CO emissions in Puget Sound urban areas come from transportation sources. Maximum CO concentrations measured regionally have decreased considerably over the past 20 years (see Exhibit 8). Other transportation-related pollutants such as ozone have followed similar but less pronounced trends (see Exhibit 9).

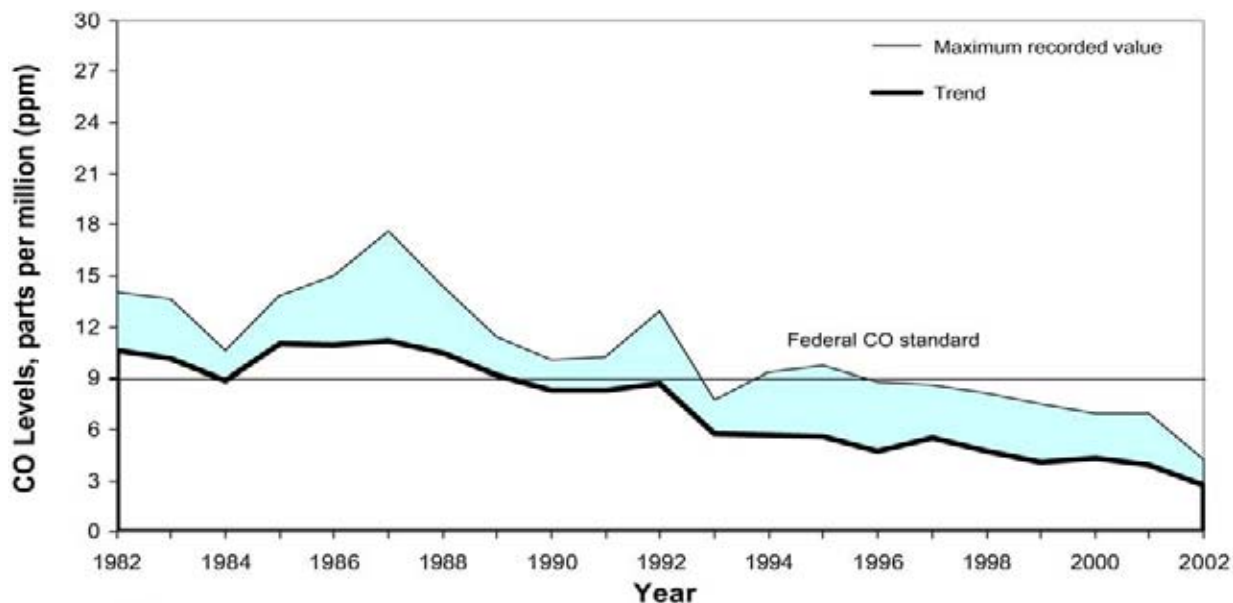
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### Criteria Pollutants

The 1970 amendments to the Clean Air Act required the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for certain pollutants known to be hazardous to human health. The EPA has identified and set standards to protect human health.

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Exhibit 8. Puget Sound Carbon Monoxide Trend



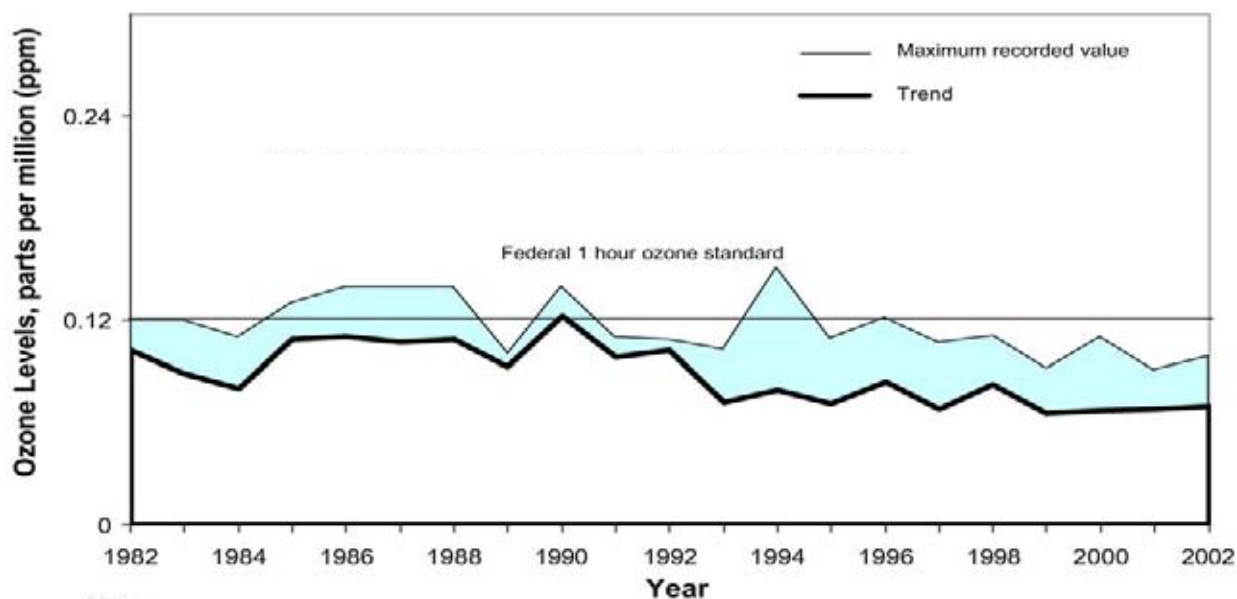
**Note:**

The trend line represents the average of the carbon monoxide values that fall within the upper one percent of the observations.

Data for 2002 are incomplete and not valid.

Source: Washington State Department of Ecology 2003

Exhibit 9. Puget Sound Ozone Trend



**Note:**

The trend line represents the average of the ozone values that fall within the upper one percent of the observations.

Data for 2002 are incomplete and not valid.

Source: Washington State Department of Ecology 2003

# Potential Effects

## How do we evaluate air quality effects from the completed project?

The regional analysis of air quality effects evaluated in the I-405 Programmatic EIS Air Quality Review (WSDOT 2002) includes the effects of construction in the Bellevue Nickel Improvement Project study area as part of the implementation of the I-405 Corridor Program. The regional effects have not changed substantially since that analysis; therefore, we have not repeated them in this study.

PSRC included the Corridor Program Selected Alternative in the MTP and the Transportation Improvement Plan (TIP) (see sidebar) as a project that conformed to the Puget Sound regional air quality maintenance plans. This demonstrates that the project will not cause or contribute to the exceedances of the NAAQS at the regional level.

## How will project operation affect air quality?

Because the project will not increase traffic volumes at any intersection or change the configuration of any intersection, there will be no substantial localized increase or decrease in air quality between the Build Alternative and the No Build Alternative.

The project is exempt from project-level conformity requirements per 40 CFR 93.123.

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### Regional Conformity

Under the Clean Air Act, a transportation project may not cause or contribute to an exceedance of the NAAQS. In air quality maintenance areas, regionally significant projects are evaluated for their conformity to Air Quality Maintenance Plans. Projects that conform to the plan are not expected to cause exceedance of the standard.

In the Puget Sound Region, the PSRC determines regional conformity by including a project in the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Plan (TIP).

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### What is the Tier II Gasoline/Sulfur Rule?

The U.S. Environmental Protection Agency (USEPA) has set new federal emission standards to reduce pollutant emissions from passenger cars, light trucks, and larger passenger vehicles.

## What are projected regional air pollutant emission trends?

PSRC recently updated the regional emission analysis, which evaluated the air quality conditions in the area for *Destination 2030*, the current MTP for the Central Puget Sound region through 2030. The recently completed emission analysis includes updates to reflect new EPA emission requirements, including the Tier II Gasoline/Sulfur Rule and the latest plans for jurisdictions within the Puget Sound region. The revised emission budget (maximum allowed emissions) from the latest AQMP and the most recent emission trend modeling are shown in Exhibit 10.

Exhibit 10. Puget Sound Emissions Budget

Pollutant	PSRC Metropolitan Transportation Plan			
	AQMP Budget*	2010 Forecast	2020 Forecast	2030 Forecast
CO	1,497	684	530	574
VOCs	248	144	145	192
NO <sub>x</sub>	263	189	168	208

\*Represents the motor vehicle emissions budget for each pollutant as identified in the appropriate maintenance plan. All other values represent modeled emissions.  
 Source: PSRC (2004).

Based on the *Destination 2030* analysis, we expect none of the future transportation emissions scenarios to exceed the emissions budget for each pollutant as identified in the AQMP budget for CO and ozone (evaluated in *Destination 2030* with separate budgets for volatile organic compounds [VOCs] and nitrogen oxides [NO<sub>x</sub>], which largely drive ozone formation in the Central Puget Sound region). This means that the projected regional emission rates are anticipated to be lower than the rates necessary to maintain compliance with the NAAQS.

We expect the downward trend in CO and NO<sub>x</sub> to continue for the Puget Sound region through 2020; however, we expect that it will begin increasing again by 2030. The decrease will result because improved emission control technology in newer vehicles will offset increases in travel in the region through 2020. Improved technology probably cannot continue to offset the growth in travel between 2020 and 2030. The future trend for VOCs shows a gradual increase in emissions between 2010 and 2030. However, we expect VOCs to remain below the emissions budget through 2030.



## How do we evaluate air pollutant emissions that occur during construction?

Construction effects were evaluated qualitatively. For air pollutant emission effects during the construction phase, we summarize the findings of the I-405 Programmatic EIS Air Quality Review.

## How will project construction temporarily affect air quality?

Particulate emissions will vary from day to day depending on level of activity, specific operations, and weather conditions. Particulate emissions will depend on soil moisture, silt content of soil, wind speed, and the amount and type of equipment in operation. Larger dust particles will settle near their source, while fine particles will disperse over greater distances from the construction site.

The quantity of fugitive dust or particulate emissions will be proportional to the area of the construction operations and the level of activity. Based on field measurements of suspended dust emissions from construction projects, an approximate emission factor for the construction operations will be 1.2 tons per acre of construction per month of activity (EPA 1995).

Uncontrolled fugitive dust from construction activities will be noticeable near construction sites. PSCAA regulations will require mitigation measures to control the dust during construction and to avoid the deposit of mud on paved streets (PSCAA Regulation 1, Article 9). The construction mitigation section of the I-405 Programmatic EIS (Section 3.1.6.1) identifies appropriate mitigation and control measures. We summarize them in the Mitigation section of this report.

In addition to particulate emissions, heavy trucks and construction equipment powered by gasoline and diesel engines will generate CO and NO<sub>x</sub> in exhaust emissions. If construction traffic reduces the speed of other vehicles in the area, emissions from traffic will increase slightly while those vehicles are delayed. These emissions will be temporary and limited to the immediate area around the construction site. Their contribution to total emissions in the study area will be small compared with automobile traffic because construction traffic will be a very small fraction of the total traffic in the area.

Some phases of construction will result in short-term odors, particularly if asphalt is used for paving operations. People near the construction site might notice such odors, but the atmosphere will dilute their effect as distance from the site increases.

## **Does the project have other effects that are delayed or distant from the project?**

Because the project is part of the I-405 Corridor Program Selected Alternative that was included in the adopted MTP and the TIP, regulatory agencies expect the project to conform to Puget Sound regional AQMPs and therefore will not cause or contribute to exceedances of the NAAQS at the regional level. In addition, because the Bellevue Nickel Improvement Project will not increase traffic or change the configuration of any intersection, the project will not degrade local air quality. We will reduce the potential for localized indirect effects from construction activities by incorporating mitigation measures into the construction specifications that control release of PM<sub>10</sub>, deposition of particulate matter, and emissions of CO and NO<sub>x</sub> within the study area.

## **Did we consider potential cumulative effects for the Build and No Build Alternatives?**

Consistent with the I-405 Corridor Program Final EIS and the results of scoping for the Bellevue Nickel Improvement Project, WSDOT analyzed the cumulative effects for this discipline. The analysis appears in the Cumulative Effects Analysis Discipline Report (WSDOT 2005).

## **Does the project conform to air quality standards?**

The project area includes maintenance areas for CO and ozone. Revised State Implementation Plans (SIPs) must comply with the project-level conformity criteria described in the EPA Conformity Rule and with Washington Administrative Code (WAC) Chapter 173-420. Conformity requires that transportation activities will not:

- cause or contribute to any new violation of the NAAQS,

- increase the frequency or severity of any existing violation of the NAAQS, or
- delay the timely attainment of the NAAQS.

The Bellevue Nickel Improvement Project is in the PSRC MTP but not yet in the TIP (Transportation Improvement Plan). Because the project has been included in the MTP modeling, it is known to meet regional conformity technical requirements; however, it does not yet meet the procedural requirement of TIP inclusion. Once the project is included in the TIP, it will meet all requirements of 40 CFR Part 93 and WAC 173-420, and demonstrate conformity to the SIP. Because the project will not increase traffic or change the configuration of any intersection, there will be no substantial increase or decrease in air quality between the Build Alternative and the No Build Alternative. The project is exempt from project-level conformity requirements per 40 CFR 93.123; therefore, we discuss localized effects on air quality based on regional air pollutant emission trends.



# Measures to Avoid or Minimize Project Effects

The I-405 Programmatic EIS Air Quality Review addressed avoidance measures to be used during construction. We summarize below the measures applicable to the Bellevue Nickel Improvement Project.

## How will we avoid or minimize adverse effects from construction?

We will reduce construction effects by incorporating avoidance and minimization measures into the project's construction specifications, as described in Appendix A. These measures will control PM<sub>10</sub>, deposition of particulate matter, and emissions of CO and NO<sub>x</sub> during construction.

## Does the design or operation of the Build Alternative require mitigation?

Because we do not anticipate any adverse effects from the design or operation of the project, we do not include measures to avoid or minimize effects.



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Additional travel lanes will immediately benefit local residents, commuters, transit riders, and freight haulers.

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## Appendix A

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### Avoidance and Minimization Measures



# Avoidance and Minimization Measures

The following sections describe the established design and construction practices that WSDOT will include to avoid or minimize effects to the various environmental resources during both the construction and operation phases of the project.

## Project Measures to Avoid or Minimize Effects During Construction

Design elements, such as modifications to boundaries of areas that can be affected, have been incorporated into the project specifications, construction plans, and procedures, to help avoid or minimize most potential construction impacts. When appropriate, monitoring will be conducted to ensure that these design and construction measures are effective.

### Measures for Geology, Soils, and Groundwater

- WSDOT will prepare and implement a Temporary Erosion and Sedimentation Control (TESC) plan consisting of operational and structural measures to control the transport of sediment. Operational measures include removing mud and dirt from trucks before they leave the site, covering fill stockpiles or disturbed areas, and avoiding unnecessary vegetation clearing. Structural measures are temporary features used to reduce the transport of sediment, such as silt fences and sediment traps.
- WSDOT will reduce degradation of moisture-sensitive soils by limiting major earthwork to the drier, late spring through early fall construction season; by maintaining proper surface drainage to avoid ponding of surface water or groundwater; by minimizing ground disturbance through limiting the use of heavy equipment, limiting turns, and/or not tracking directly on the subgrade; and by covering the final subgrade elevation with a working mat of crushed rock and/or geotextile for protection. Mixing a soil admix such as cement into the subgrade may also add strength and stabilize the ground.
- WSDOT will determine acceptable limits for off-site construction-related ground vibration before construction begins and demonstrate that off-site ground vibrations are within the limits set for the project through the use of vibration-monitoring equipment.
- WSDOT will identify areas subject to shaking from a large earthquake and will mitigate risks using ground modifications or other procedures identified in the WSDOT Geotechnical Design Manual.
- WSDOT will implement construction procedures identified in the geotechnical investigation to maintain or enhance slope stability in areas potentially underlain by landslide-prone soils.
- WSDOT will protect the Kelsey Creek aquifer from contamination by construction-related spills by development and implementation of BMPs and a Spill Prevention Control and

Countermeasures plan (SPCCP). The SPCC will specifically address fuel spills from vehicles and from spills of other chemicals commonly transported over I-405. Spill response equipment will be located at regular and specified intervals within the project area for minimizing countermeasure response times.

- WSDOT will ensure only clean fill is imported and placed for the project and will require documentation for fill brought onto the site from the supplier certifying that the fill does not exceed Washington State soil cleanup standards. If documentation is not available, testing of imported fill soils will be required prior to placement. Suspect soils encountered during project construction will be tested and, where necessary, removed from the site and disposed of in accordance with Washington State regulations.
- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses. Washout from concrete trucks will not be dumped into storm drains or onto soil or pavement that carries stormwater runoff. A wash down area for equipment and concrete trucks will be designated and the use of thinners and solvents to wash oil, grease, or similar substances from heavy machinery or machine parts will be prohibited.
- WSDOT will obtain a NPDES (National Pollutant Discharge Elimination System) permit and will conduct a regular program of testing and lab work to ensure that water encountered during construction meets the water quality standards specified in the NPDES permit.
- WSDOT will to meet the NPDES water quality standards prior to the discharge of the encountered water to a surface water body, such as Kelsey Creek. If necessary, water quality will be improved, such as by using sediment ponds to allow sediment to settle out prior to discharge.
- If it is necessary to install seepage drains to control seepage for retaining walls and fill embankments, WSDOT will include special provisions in the design to discharge drain flow back into affected areas, including wetlands.

## Measures for Water Quality

In addition to measures for geology, soils, groundwater, and for hazardous materials that are protective of water quality, the following measures would be implemented for water quality.

- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses.
- Washout from concrete trucks will not be dumped into storm drains or onto soil or pavement that carries stormwater runoff.
- Thinners and solvents will not be used to wash oil, grease, or similar substances from heavy machinery or machine parts.
- WSDOT will designate a wash down area for equipment and concrete trucks.

## Measures for Wetlands

- WSDOT will protect, preserve, and enhance wetlands in the project area during the planning, construction, and operation of transportation facilities and projects consistent with USDOT Order 5660.1A, Executive Order 11990, and Governor's Executive Orders EO 89-10 and EO 90-04.
- WSDOT's project-level design and environmental review has included avoidance, minimization, restoration, and compensation of wetlands. WSDOT will implement these measures prior to or concurrent with adverse effects on wetlands, to reduce temporal losses of wetland functions.
- WSDOT will follow guidance contained in the wetlands section of the WSDOT Environmental Procedures Manual (WSDOT 2004a), which outlines the issues and actions to be addressed prior to authorizing work that could affect wetlands.
- WSDOT will use high-visibility fencing to clearly mark wetlands to be avoided in the construction area.

## Measures for Upland Vegetation and Wildlife

- WSDOT will ensure mitigation measures established in the I-405 Corridor EIS will be implemented on the Bellevue Nickel Improvement Project.
- WSDOT will prepare and implement a revegetation plan. In addition, areas with mixed forest will not be removed for temporary use (i.e., construction staging). If an area of mixed forest must be removed for roadway construction, it will be replaced with plantings of native tree and shrub species within the affected area.
- WSDOT will adhere to project conditions identified in the Biological Assessment and agency concurrence letters.
- WSDOT will limit construction activity to a relatively small area immediately adjacent to the existing roadway to minimize vegetation clearing and leave as many trees as possible.

## Measures for Fisheries and Aquatic Resources

- WSDOT will implement construction BMPs (such as silt fencing or sedimentation ponds) to avoid disturbing sensitive areas during the development and use of any staging areas, access roads, and turnouts associated with resurfacing activities.
- WSDOT will not allow in-water work to occur except during seasonal work windows established to protect fish.
- WSDOT will require that all stormwater treatment wetland/detention facilities are sited and constructed at a sufficient distance from named and unnamed streams so no grading or filling in the streams or the streamside zones will be required.

## Measures for Air Quality

- WSDOT will require preparation and implementation of a Fugitive Dust Control Plan in accordance with the Memorandum of Agreement between WSDOT and PSCAA Regarding Control of Fugitive Dust from Construction Projects (October 1999).
- During dry weather, exposed soil will be sprayed with water to reduce emissions of and deposition of particulate matter (PM<sub>10</sub>).
- WSDOT will provide adequate freeboard (space from the top of the material to the top of the truck), cover truckloads, and, in dry weather, wet materials in trucks to reduce emission of and deposition of particulate matter during transport.
- WSDOT use wheel washers to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways.
- WSDOT will remove particulate matter deposited on public roads to reduce mud on area roadways.
- WSDOT will cover or spray with water any dirt, gravel, and debris piles during periods of high wind when the stockpiles are not in use to control dust and transmissions of particulate matter.
- WSDOT will route and schedule construction trucks to reduce travel delays and unnecessary fuel consumption during peak travel times, and therefore reduce secondary air quality impacts (i.e. emissions of carbon monoxide and nitrogen oxides) that result when vehicles slow down to wait for construction trucks.

## Measures for Noise

- Noise berms and barriers will be erected prior to other construction activities to provide noise shielding.
- The noisiest construction activities, such as pile driving, will be limited to between 7 AM and 10 PM to reduce construction noise levels during sensitive nighttime hours.
- Construction equipment engines will be equipped with adequate mufflers, intake silencers, and engine enclosures.
- Construction equipment will be turned off during prolonged periods of nonuse to eliminate noise.
- All equipment will be maintained appropriately and equipment operators will be trained in good practices to reduce noise levels.
- Stationary equipment will be stored away from receiving properties to decrease noise.
- Temporary noise barriers or curtains will be constructed around stationary equipment that must be located close to residences.
- Resilient bed liners will be required in dump trucks to be loaded on site during nighttime hours.

- WSDOT use Occupational Safety and Health Administration (OSHA)-approved ambient sound-sensing backup alarms that would reduce disturbances during quieter periods.

## Measures for Hazardous Materials

### Known or Suspected Contamination within the Build Alternative Right of Way

- WSDOT will prepare an SPCCP that provides specific guidance for managing contaminated media that may be encountered within the right of way (ROW).
- WSDOT may be responsible for remediation and monitoring of any contaminated properties acquired for this project. WSDOT will further evaluate the identified properties before acquisition or construction occurs. Contamination in soils will be evaluated relative to the Model Toxics Control Act (MTCA).
- If WSDOT encounters an underground storage tank (UST) within the ROW, WSDOT will assume cleanup liability for the appropriate decommissioning and removal of USTs. If this occurs, WSDOT will follow all applicable rules and regulations associated with UST removal activities.
- WSDOT will conduct thorough asbestos-containing material/lead paint building surveys by an Asbestos Hazard Emergency Response Act (AHERA)-certified inspector on all property structures acquired or demolished. WSDOT will properly remove and dispose of all asbestos-containing material/lead-based paint in accordance with applicable rules and regulations.
- Construction waste material such as concrete or other harmful materials will be disposed of at approved sites in accordance with Sections 2-01, 2-02, and 2-03 of the WSDOT Standard Specifications.
- WSDOT may acquire the responsibility for cleanup of any soil or groundwater contamination encountered during construction (that must be removed from the project limits) within WSDOT ROW. Contamination will be evaluated relative to Model Toxics Control Act (MTCA) cleanup levels.
- WSDOT will consider entering into pre-purchaser agreements for purpose of indemnifying itself against acquiring the responsibility for any long-term cleanup and monitoring costs.
- All regulatory conditions imposed at contaminated properties (e.g., Consent Decree) associated with construction will be met. These conditions could include ensuring that the surrounding properties and population are not exposed to the contaminants on the site: i.e., WSDOT will ensure that the site is properly contained during construction so that contaminants do not migrate offsite, thereby protecting the health and safety of all on-site personnel during work at the site.

### Known or Suspected Contamination Outside of the Right of Way

- Contaminated groundwater originating from properties located up-gradient of the ROW could migrate to the project area. WSDOT generally will not incur liability for groundwater contamination that has migrated into the project footprint as long as the agency does not

acquire the source of the contamination. However, WSDOT will manage the contaminated media in accordance with all applicable rules and regulations.

## Unknown Contamination

- If unknown contamination is discovered during construction, WSDOT will follow the SPCCP as well as all appropriate regulations.

## Worker and Public Health and Safety and other Regulatory Requirements

The WSDOT will comply with the following regulations and agreements:

- State Dangerous Waste Regulations (Chapter 173-303 WAC);
- Safety Standards for Construction Work (Chapter 296-155 WAC);
- National Emission Standards for Hazardous Air Pollutants (CFR, Title 40, Volume 5, Parts 61 to 71);
- General Occupational Health Standards (Chapter 296-62 WAC); and
- Implementing Agreement between Ecology and WSDOT Concerning Hazardous Waste Management (April 1993).

## Hazardous Materials Spills During Construction

- WSDOT will prepare and implement a SPCCP to minimize or avoid effects on human health, soil, surface water and groundwater.

## Measures for Traffic and Transportation

- WSDOT will coordinate with local agencies and other projects to prepare and implement a Traffic Management Plan (TMP) prior to making any changes to the traffic flow or lane closures. WSDOT will inform the public, school districts, emergency service providers, and transit agencies of the changes ahead of time through a public information process. Pedestrian and bicycle circulation will be maintained as much as possible during construction.
- Prior to and during construction, WSDOT will implement strategies to manage the demand on transportation infrastructure. These transportation demand management strategies will form an important part of the construction management program and will be aimed at increasing public awareness and participation in HOV travel. The major focus will be on expanding vanpooling and van-share opportunities. Other elements of the transportation demand management plan may include:
  - increased HOV awareness and public information, and
  - work-based support and incentives.



## Measures for Visual Quality

- WSDOT will follow the I-405 Urban Design Criteria. Where the local terrain and placement of light poles allow, the WSDOT will reduce light and glare effects by shielding roadway lighting and using downcast lighting so light sources will not be directly visible from residential areas and local streets.
- WSDOT will restore (revegetate) construction areas in phases rather than waiting for the entire project to be completed.

## Measures for Neighborhoods, Businesses, Public Services and Utilities

- WSDOT will prepare and implement a transportation management plan (TMP). If local streets must be temporarily closed during construction, WSDOT will provide detour routes clearly marked with signs.
- WSDOT will coordinate with school districts before construction.
- WSDOT will implement and coordinate the TMP with all emergency services prior to any construction activity.
- WSDOT will coordinate with utility providers prior to construction to identify conflicts and resolve the conflicts prior to or during construction. Potential utility conflicts within WSDOT ROW will be relocated at the utility's expense prior to contract award.
- WSDOT will prepare a consolidated utility plan consisting of key elements such as existing locations, potential temporary locations and potential new locations for utilities; sequence and coordinated schedules for utility work; and detailed descriptions of any service disruptions. This plan will be reviewed by and discussed with affected utility providers prior to the start of construction.
- WSDOT will field verify the exact locations and depths of underground utilities prior to construction.
- WSDOT will notify neighborhoods of utility interruptions by providing a scheduled of construction activities in those areas.
- WSDOT will coordinate with utility franchise holders and provide them with project schedules to minimize the effects of utility relocations (for example, equipment procurement times, relocation ahead of construction, etc.)
- WSDOT will notify and coordinate with fire departments for water line relocations that may affect water supply for fire suppression, and establish alternative supply lines prior to any breaks in service; and to ensure that fire departments can handle all calls during construction periods and to alleviate the potential for increased response times.
- WSDOT will notify and coordinate with police departments to implement crime prevention principles and to ensure that they have adequate staffing to provide traffic and pedestrian control.

- WSDOT will maintain access to businesses throughout the construction period through careful planning of construction activities and an awareness of the needs to provide adjacent properties with reasonable access during business hours. As part of construction management, WSDOT will prepare access measures. WSDOT will make provisions for posting appropriate signs to communicate the necessary information to potential customers.
- WSDOT will keep daytime street closures to a minimum to provide access for businesses during regular business hours.

## Measures for Cultural Resources

- WSDOT will prepare an Unanticipated Discovery Plan for the project that WSDOT will follow. This will avoid or minimize unanticipated effects to historic, cultural, and archaeological resources.

## Project Measures to Avoid or Minimize Effects During Project Operation

The following sections describe the measures that WSDOT will implement during project operation.

### Measures for Surface Waters and Water Quality

- WSDOT will follow the Highway Runoff Manual for both the design and implementation of stormwater facilities. WSDOT is not required to manage flow where drainage is directly to Mercer Slough. Where drainage is to a tributary to Mercer Slough, WSDOT will construct a stormwater management system that does provide flow control.

### Measures for Fisheries and Aquatic Resources

- WSDOT will compensate for adverse effects to fish habitat and aquatic resources by providing in-kind mitigation. This in-kind mitigation will take the form of on-site, off-site, or a combination of on- and off-site mitigation.
- Off-site mitigation could include planting native riparian vegetation outside of the study area in areas where restoring native riparian buffers may have a greater benefit to fish and aquatic species. Mitigation could be concentrated along streams with high fish use where important stream processes and functions related to riparian buffers (for example, large woody debris [LWD] recruitment levels, litter fall, and bank stabilization) are impaired.
- On-site/off-site mitigation could include installing in-stream habitat features (for example, boulders or LWD) in the streambed downstream of the project footprint to increase the habitat complexity of the affected waterbody.

- Ongoing maintenance (during and post-construction) of stormwater treatment and detention facilities by WSDOT will not include the application of any chemical weed control agents (e.g., herbicides).

## Measures for Upland Vegetation and Wildlife

- WSDOT will replace areas of mixed forest that will be permanently removed for roadway construction with plantings of native tree and shrub species within the affected area.